Plot Locator User Guide

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SUMMARY

The Plot Locator App was created to help scientists, with or without GPS services, locate their plots in the field. The app creates an in-app searchable database[1] that stores the study area name, GPS coordinates[2], date, site and plot numbers, and information about the plot location such as field notes and the number of steps and distance from landmarks. An optional GPS assist allows users to locate plots using GPS and provides GPS availability and accuracy information. A digital compass and Google Maps directions options provide users with additional location aids. Field data are saved as a CSV file on the user's mobile device and can be saved externally. The user assumes all risk when using the Plot Locator App to collect and retrieve data (i.e., also use traditional methods until user is familiar with the app).

Plot Locator Requirements and Compatibility

The Plot Locator app is an Android app. Plot Locator can be used with Android versions 4.1 – 8+. To use the optional GPS function, Google Maps, and to save your CSV file externally, you will need access to GPS satellites, a cell tower, and/or Wi-Fi signal. The app requires that your device saves to an SD card or emulated SD card. It is recommended that you create a simple test file to determine if your device saves to the file location used in the Plot Locator app.

DIRECTIONS AND NOTES

ENTER PLOT DATA

When you want to create a new data file, or continue using a previously created Plot Locator data file, click "Enter Plot Data" from the home screen[1].

Creating a new file[1]

If this is your first-time using Plot Locator, or you want to create a new file, select "New File." You can also access the "New File" option by clicking the options box, ⋮ from the top of the home and file screens and selecting, "Create New File."

Enter a unique file name. To save your file, click "Save File."

Using a previously created file[1]

Although it is not necessary to create one file containing your various research areas and sites for an individual project, it is recommended that you do so. Creating one file per project will create one database that you can use when you use the Plot Locator app to find your plots. It also reduces the number of files stored on your mobile device.

Select "Get File" to retrieve a previously created Plot Locator file. Click "Select File to Load." From the drop-down list select the desired file. If you have uninstalled and reinstalled the app, your file might not be located.

Entering study area information

The "Study Area" screen will pop up after you have successfully saved or retrieved your file. Enter your study area name, site name or number, and plot number. To change your study area information, click "RESET." Click "SAVE" when you want to save your study area information. The date and GPS coordinates[2] are automatically entered each time that you enter and save your plot data. Once you have entered and saved your site information, click "PLOT."

Entering plot data

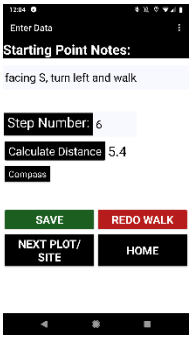
The Plot Locator app uses the user's step number and stride length to estimate the distance in meters from a starting point.

Enter the stride length of the individual who will be walking. Click "SAVE" to save your stride length information. The stride length will be used while the app is open. If you want to change the stride length during a field session, simply close and reopen the app. Be sure to select "Get File" if you wish to

continue entering data into the same database. If you wish to use the number of steps as the distance value, enter "1" as your stride length (e.g., 10 steps from oak tree also equals 10 "m" from oak tree).

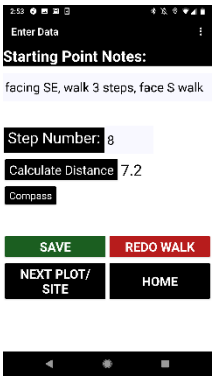
Once the stride length has been entered and saved, the plot location screen will appear. Enter your starting point notes for a plot, for example, "face N with back to oak tree and turn left."

Step Counter, Distance Calculator, Compass



Enter your step number. To calculate the distance, click the "Calculate Distance" button. The distance will be displayed next to the button. To use the digital compass, click the "Compass" button. The compass points to magnetic north and provides cardinal directions. If you want to redo the plot steps and distance, click "REDO WALK." Click "SAVE" to save your starting point notes, and step and distance information.

Multiple steps and notes for a single plot



If you want to enter multiple starting points and distances for a single plot, just enter your notes *and* the distance/step number in the "Starting Point Notes:" textbox and click "REDO WALK" *instead of* "SAVE." Clicking "REDO WALK" will provide the option of only clearing out the plot distance and step number. Select this option. Enter your new starting point or landmark description into the "Starting Point Notes:" textbox, enter your step number into the "Step Number" textbox, click the "Calculate Distance" button, and then enter the new distance and step number into the "Starting Point Notes:" textbox next to your prior notes. Continue entering notes and steps into the "Starting Point Notes:" textbox until you are finished. For example, for a user with a 0.9 m stride length, you could enter "at large rock face N, walk 7 steps/6.3 m, face SE walk 4 steps/3.6 m" into the "Starting Point Notes:" textbox. After you have entered all your notes and steps into the "Starting Point Notes:" textbox, click "SAVE." Once you click "SAVE," all the notes and the last plot distance and step number will be saved to your CSV file.

Next Plot/Site

When you are ready to move on to the next study area and/or site and/or plot click "NEXT PLOT/SITE." You will have the option of using your current study area name or entering a new study area name.

Closing Enter Plot Data

When you are finished using the app, click the three vertical dots at the top of the screen and select "Stop this application." To officially close the app in Android, depending on your device and version of Android, simply click the square at the bottom of the navigation bar located at the bottom of the screen. This should bring up a list of recently used apps, close the app by clicking on the "X" for the app or swipe the app off the screen.

LOCATE PLOT

To locate your plot, open the app or return to the Home screen and select "FIND MY PLOT."

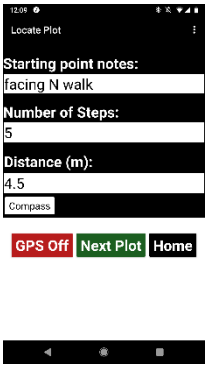
Select File[1]

On the Locate Plot screen, click "Select File" to pull up the list of your saved Plot Locator CSV files. Select the file that you wish to use. If you have uninstalled the app and then reinstalled it, the app will note be able to retrieve your files associated with the prior installation. However, you can retrieve the files for use outside of the app.[1]

Selecting study area information

Select the study area, site, and plot name or number from the drop-down boxes. Only the sites and plots associated with your selected study area will be available. If you have a long list of study areas, sites, and plots, you can use a search box which will appear when you click on the drop-down boxes. To change your study area, simply select a new study area. Click "Find Plot." If the app cannot locate your study area information, you will receive a message to reset the study area and to check your study area information.

Displaying plot location information

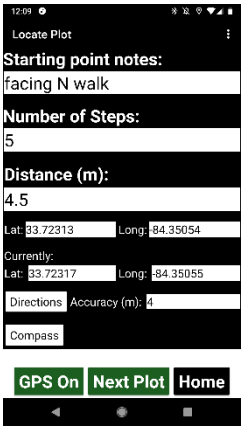


Once your study area information has been retrieved, your starting point notes will appear along with the number of steps and distance (m).

Compass

Click the "Compass" button to open the digital compass. You can use the compass to help locate your plots and sites. The compass points to magnetic north.

GPS Assist and Google Maps



If you have connectivity, you can use the GPS[2] assist. Click the red "GPS Off" button to turn on the GPS assist. The GPS coordinates for your plot will appear along with your current coordinates. GPS accuracy (m) will also be displayed if this function is available on your device. You can turn off GPS assist by clicking the green "GPS On" button.

To use Google Maps, click "Directions." Your saved plot coordinates will be sent to Google Maps. Google Maps will determine your current location. You can then use Google Maps for assistance with locating your plots.

Next Plot/Site

When you are ready to move on to your next plot, click "NEXT PLOT."

Closing Locate Plot

When you are finished using the app, click the three vertical dots at the top of the screen and select "Stop this application." To officially close the app in Android, depending on your device and version of Android, simply click the square at the bottom of the navigation bar located at the bottom of the screen.

This should bring up a list of recently used apps, close the app by clicking on the "X" for the app or swipe the app off the screen.

FILE RETRIEVAL AND DELETION

Exporting Files

From the Home or File screens, click the options box, ☰, at the top of the screen. Select, "Export File." Select the file that you wish to export/externally save. Depending on your mobile device and apps that you have previously installed, you will have a variety of export options. For example, you may email your file or save to Google Drive.

Deleting Files

From the Home or File screens, click the options box, ☰, at the top of the screen. Select "Delete File" and then select the file that you wish to delete. The file will be permanently deleted from your device.

NOTES

[1]CSV Files

Files are saved to your mobile device SD card or emulated SD card when you save your site and plot location data. *If your mobile device does not save to the SD card, or emulated SD card, your data will not be saved and a file will not be created.* Create a test file to see if your device saves to the SD card.

If you uninstalled the app before you exported your data files and wish to retrieve your data files stored on your mobile device, then you will need to use a file manager app to locate and retrieve your files.

[2]GPS

GPS coordinates can only be determined if GPS is turned on in your mobile device settings and a signal is available. The app will notify you if GPS is available. You can also look for the GPS symbol on your mobile device to determine if your device is using GPS. If your mobile device can determine GPS accuracy, an accuracy estimate is provided on the Locate Plot, plot information screen. This estimate is based on your device's location services mode (see below) and the frequency of GPS accuracy updates is based on your device's update frequency. You will be alerted to changes in GPS availability while the app is in use.

Mobile devices use a range of location methods to determine location and accuracy and these values will frequently change as satellites, towers, and networks are located and pinged. The default setting on Android devices is to use a combination of satellites, cell towers, and networks to provide the highest accuracy with the lowest rate of battery consumption. While the Plot Locator app cannot change the mode that you use for location services (only GPS vs. the previously mentioned combination), you can change the mode on your own device. To only use GPS on devices running Android 9.0, go to Settings > Security & Location > Advanced > Google Location Accuracy and turn off Location Accuracy. To determine how to change the location services mode on devices running older versions of Android, go to https://support.google.com/accounts/answer/3467281?hl=en and scroll to the bottom of the page.

To conserve battery power, you can turn off the GPS by clicking the GPS button in the app. Once off, the GPS button will be red and will display a "GPS OFF" message. To turn off location services on your device, swipe down from the top of your device screen and click the "Location" icon off.

Data Entry Screen and Locate Plot Screen GPS

If the app cannot obtain GPS coordinates, the GPS button will turn gray and continue to display a "GPS ON" message. When the GPS coordinates have been obtained, you will be alerted with a notification and the GPS button will turn green. If you do not see a GPS symbol on your mobile device, check the GPS settings of your device and then press the "GPS ON" button to see if you can activate your GPS. Once the sensor determines a location change, the GPS coordinates will update every second. Depending on signal availability, and your default mobile device settings, the GPS coordinates and accuracy may take longer to update and may cause a brief lag in GPS notifications (i.e., "GPS is working.," "Searching for a signal.").

Locate Plot Screen GPS

If the coordinates and accuracy do not update, and the in-app GPS is on and the button is green, then your device may be experiencing trouble locating a signal or your location services are off. You can turn the in-app GPS off and on, to refresh the coordinates and accuracy. Also, check your location services to determine if they are on. If the current coordinates are displayed, but not accuracy information, then your device may not have the ability to determine GPS accuracy.

Literature Cited:

Google. 2018. Manage your Android device's location settings. [online]. Website https://support.google.com/accounts/answer/3467281?hl=en [accessed 29 November 2018].